

# A Quieter Car Ride With Kenaf

**A** quieter ride could be just down the road for drivers and their passengers thanks to a crop known as kenaf.

A relative of okra and cotton that towers 12 to 15 feet, kenaf is grown primarily as a fiber source for low-grade paper, particleboard, and oil absorbents.

But kenaf fiber may find its way into the interiors of cars as lightweight insulation against road noise, which can penetrate door panels, dashboards, floor mats, package trays, and other areas.

Currently, polyester and polypropylene rank among the top materials of choice for auto insulation, says Dharnidhar (D.V.) Parikh, head of nonwovens research at ARS' Cotton Textile Engineering Unit in New Orleans, Louisiana.

Providing consumers with a quieter ride is a top priority among auto makers—not to mention a marketing advantage over their competitors—a fact Parikh has learned through collaboration with Janesville Products, a Norwalk, Ohio, manufacturer of nonwoven products for the automotive industry.

In kenaf fiber, Parikh sees a lightweight, biodegradable, renewable resource that can be obtained from a domestic crop. It can be retted and processed in a manner similar to cotton fiber. Retting partially removes lignin, a natural resin, and makes the fiber soft and pliable.

"One advantage kenaf offers is its low density, which means more fiber and less weight. Kenaf fiber's many pores serve as a natural trap for sound waves. So sound coming from any part of a car gets diffused, and the passenger and the driver have a quieter ride," says Parikh. "And it's a natural fiber rather than petroleum based, like polyester, so it's biodegradable."

To capitalize on kenaf's potential, the researchers devised a mechanical process for separating the fiber from the stalk's bark and core before retting.

"After retting, kenaf fibers are chopped to lengths of about 3 inches and then intimately blended with polypropylene before carding, which arranges the fibers in parallel strands," Parikh says. A standard needlepunching procedure is then used to produce a nonwoven fabric comprising the 50:50 mixture of kenaf fiber and polypropylene. This enables the fabric to be thermoformed into specific shapes to suit automobile interiors.

DAVID NANCE (K2976-8)



A stand of kenaf in the Texas Rio Grande Valley towers over an ARS scientist.

In studies published in the *International Nonwovens Journal*, Parikh and his collaborators tested sound absorption of the nonwoven blends using a standard protocol called the impedance tube method.

The tests, conducted by Janesville Products, also included samples of cellulose-based nonwoven fabrics made from flax, jute, and cotton. All the nonwoven blends either met or exceeded the sound-absorption range desired by motor vehicle manufacturers. Jute and kenaf earned the highest scores for blocking frequencies of 2,000 hertz. Cotton was next at 800 hertz.

Though more research is needed, Parikh is optimistic that kenaf fiber will prove its worth as an automobile insulation material, resulting in a new market for U.S. kenaf growers. Plus, he adds, "what is applicable to kenaf is likely to be applicable to other bast-fiber crops, like flax."—By **Jan Suszkiw**, ARS.

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Kenaf being harvested in the Rio Grande Valley of Texas.